

Application No. 10/620,176

REMARKS

Claims 17-22, 24-27, and 53-63 are pending. By this Amendment, claims 1-16 and 28-39 are canceled, and claim 17 is amended. Claims 53-63 are presently withdrawn from consideration.

Claim 17 has been amended to more particularly point out Applicants' claimed invention by incorporating the features of claim 28 to more clearly illustrate that irradiation of the photosensitive optical material is performed to induce a gradient in the index-of-refraction along an irradiation direction. The amendment is supported by claim 28 as filed. No new matter is introduced by the amendment.

All pending claims stand rejected. Applicants respectfully request reconsideration of the rejections based on the following analysis.

Restriction Requirement

The Examiner withdrew new claims 53-63 stating that the claims are directed to an invention independent or distinct from the originally claimed invention. Applicants respectfully assert that the Examiner's withdrawal of the claims is improper, as claim 53 represents and includes the features of claim 26 as filed written in independent form, which was fully examined in the first office action. Claim 26 was included in Group 2 as specified by the Examiner in the May 4, 2005 Office Action (Group 2 included claims 17-28), which Applicants elected with traverse in the Amendment of July 28, 2005. Applicants should be allowed to proceed with each claim in Group 2, including claim 53 (claim 26 as filed). Since this claim was already examined, clearly it is no additional burden for the Examiner to continue to examine the claim. Claims 53-63 should clearly be examined under the MPEP 803. As such, Applicants respectfully traverse the Examiner's withdrawal of claims 53-63 and request examination of the claims.

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Rejection Over Zhou under 35 U.S.C. § 102

The Examiner rejected claim 17 under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent Publication No. 2002/0048727 to Zhou et al. (Zhou). To advance prosecution of the case, Applicants have amended claim 17 to more particularly point out Applicants' claimed invention by incorporating the features of claim 28 to more clearly illustrate that irradiation of the photosensitive optical material is performed to induce a gradient in the index-of-refraction along an irradiation direction, the gradient being at least about  $1 \times 10^{-8}$  index units per micron along the irradiation direction. Since Zhou clearly does not explicitly or inherently teach all of the claim elements, Zhou does not prima facie anticipate Applicants' claimed invention. Applicants respectfully request reconsideration of the rejection based on the following comments.

While Zhou teaches irradiating a film to introduce a graded refractive index **along a lateral direction**, the reference does not teach or suggest a method to induce a gradient in index of refraction **along an irradiation direction**. See Zhou, para. [0034], lines 8-13 ("When such a patterned gray scale mask is employed in a process according to one exemplary embodiment of the present invention, the predetermined portion of the photosensitive lead-silicate-containing film placed under gray scale region 304 will receive a lateral (i.e., in the horizontal direction) graded exposure to UV light . . . [S]uch a lateral graded exposure to UV light will result in the predetermined portion of the photosensitive lead-silicate-containing film having a **lateral graded refractive index**."), emphasis added. In other words, any index of refraction gradient in Zhou would be along the length of a film **perpendicular to the irradiation direction**, not along the irradiation direction in the film. The present claim specifies an index change that would eliminate any possible inherency issue with regard to an index variation along the irradiation direction based on the Zhou method.

Moreover, claim 17 is directed towards a method for producing a light-induced gradient in index-of-refraction using a light having a selected intensity and wavelength for a

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selected amount of time. In contrast, any grading in Zhou is induced by a mask having a grey scale patterned thereon (see, e.g., Zhou, Fig. 5, depicting alternating transparent and non-transparent regions). Specifically, when a photosensitive film of Zhou under a mask is exposed to light, a laterally graded refractive index is induced matching the laterally graded region on the mask. Since Zhou does not teach or suggest forming a gradient in index of refraction along the irradiation direction, Zhou does not does not teach or suggest all of the features included in claim 17.

Because Zhou does not teach or suggest all of the limitations of claim 17, Zhou does not prima facie anticipate claim 17. Applicants respectfully request withdrawal of the rejection of claim 17 as being unpatentable over Zhou et al.

#### Rejection Over Payne under 35 U.S.C. § 103(a)

The Examiner rejected claims 17-22 and 24-28 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,160,944 to Payne (Payne). Applicants incorporate by reference their comments from the Amendment of July 28, 2005. In addition, to advance prosecution of the application, Applicants have amended claim 17 to more particularly point out their claimed invention. Applicants respectfully request reconsideration of the rejection in view of the following comments.

"To establish a prima facie case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure." MPEP § 2142 (citing In re Vaack, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991)).

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The Examiner has not established a prima facie case of obviousness of Applicants' claimed invention since the cited reference does not teach or suggest all of the features included in independent claim 17, as amended. Prima facie obviousness is not established if all the elements of the rejected claim are not disclosed or suggested in the cited art. In re Ochiai, 37 USPQ 1127, 1131 (Fed. Cir. 1995). ("The test for obviousness *vel non* is statutory. It requires that one compare the claim's 'subject matter as a whole' with the prior art 'to which said subject matter pertains.'"). See also, MPEP § 2143.03 "All Claim Limitations Must Be Taught or Suggested," citing In re Royka, 180 USPQ 580 (CCPA 1974). "To establish prima facie obviousness of a claimed invention, all of the claim limitations must be taught or suggested by the prior art." MPEP § 2143.03.

Payne does not do not teach or suggest all of the features included in claim 17, as amended. Specifically, the reference does not disclose irradiating a photosensitive optical material to induce a gradient index-of-refraction **along an irradiation direction**, the gradient being at least about  $1 \times 10^{-8}$  index units per micron along the irradiation direction. Rather, Payne teaches irradiating a film to introduce a non-cyclic refractive index variation along a length of a waveguide, not method for producing a gradient in index of refraction **along an irradiation direction** in an optical material.

The Examiner states that that there would be a gradient in the structure (specifically, a gradient oriented perpendicularly to the structure with respect to claim 20) because radiation is absorbed as it passes through the photosensitive material. However, Payne is directed generally towards forming gratings in optical devices. Gratings in optical devices are generally oriented laterally along the length of the device. The approaches to form the gratings would generally involve changes in index laterally relative to the propagation direction of the light that induces the index variation. Generalizing these approaches to the formation of a gradient in index of refraction would similarly involve index variations perpendicular to the irradiation direction, as taught in Zhou. Thus, Payne clearly does not explicitly teach forming a gradient in index-of-refraction along the irradiation direction. In addition, the present claim

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specifies a lower limit of an index change that would eliminate any possible inherency issue with regard to an index variation along the irradiation direction in Payne. As such, Payne does not does not teach or suggest all of the features included in claim 17.

With respect to specific features noted by the Examiner in the claims depending from claim 17, these issues are not commented on further here because they are presently moot given the above analysis, although Applicants do not acquiesce in the Examiner's position. See MPEP § 2143.03 ("If an independent claim is nonobvious under 35 U.S.C. 103, then any claim depending therefrom is nonobvious.") Since Payne does not render Applicants' claimed invention prima facie obvious, Applicants respectfully request withdrawal of the rejection of claims 17-22 and 24-27 as being unpatentable over Payne.

#### CONCLUSIONS

In view of the foregoing, it is submitted that this application is in condition for allowance. Favorable consideration and prompt allowance of the application are respectfully requested.

The Examiner is invited to telephone the undersigned if the Examiner believes it would be useful to advance prosecution.

Respectfully submitted,



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